Best Practices for Upgrading to SQL Server 2012

Preview of the Best Practices Pre-con on Monday, Nov. 5th

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- SQL Server Intelligence Conference 2012
- SQL PASS Summit 2012
Best Practices for Upgrading to SQL Server 2012

Planning for SQL Server 2012

- Upgrading Operating System?
  - Is current OS supported by SQL Server 2012?
- Map the upgrade path
  - Upgrade vs new installation
  - Migrating in steps
- Run Upgrade Advisor
- Upgrade non-production first
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Upgrading Operating System?

• Requires a supported OS
  • Standard/Developer Editions:
    • Windows 7 SP1
    • Windows Vista SP2
    • Windows Server 2008 SP2
    • Windows Server 2008 R2 SP1
  • BI/Enterprise Editions:
    • Windows Server 2008 SP2
    • Windows Server 2008 R2 SP1

• OS upgrade/install must be done before SQL
• Evaluate if new hardware needed before upgrading
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Map the upgrade path

- **Upgrading SQL Server instance or database requires:**
  - SQL Server 2005 SP4
  - SQL Server 2008 SP2
  - SQL Server 2008 R2 SP1

- **Upgrading from an earlier version requires upgrading in steps**
  - Upgrade to minimum supported upgrade path
  - Then upgrade to SQL Server 2012

- **Databases must be upgraded in multiple steps even if doing a new installation**
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Run upgrade advisor

- Capture a trace of an average workload on production server to analyze code
  - Alternatively, use the default trace
- Point advisor to your batch SQL scripts for analysis
- Upgrade advisor for SQL Server 2012:
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Upgrade non-production

• Upgrade Engineering Team client components first
  • Select few -> all

• Server upgrades should follow same path as code
  • Development
  • Test/QA
  • Staging/Preproduction
  • Production

• Ensure that earlier environments have all components as production

• Find and fix problems before moving to next environment
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Choosing an Upgrade Path

• Migrate to new hardware
• In-place upgrades
• Side-by-side installations
• Server shuffling
• Special migrations
  • Failover clusters
  • Replication
  • Log shipping / mirroring
  • AlwaysOn Availability Groups
  • 24/7 minimal downtime environments
• Sample upgrade plan
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Migrate to new hardware
- Simplest, least problematic way to upgrade
- Migrate data to new hardware and failover
  - Log shipping
  - Database mirroring
  - Backup & restore
  - Detach & attach
  - Copy database wizard
- Rollback plan
  - Backups!
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In-place upgrades
• Least expensive upgrade plan
• Most difficult to have a functional rollback plan
• Rollback plan must include backups!

Side-by-side installation
• Least expensive upgrade plan
• Requires using named instances
  • Be sure applications support
• Migrate data to new hardware and failover
  • Log shipping
  • Database mirroring
  • Backup & restore
  • Detach & attach
  • Copy database wizard
• Rollback plan with backups
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Server shuffling

• Most complex, longest implementation
• Use similar hardware such as DR servers to migrate
• Upgrade environment in stages
• May require multiple downtimes for switchovers
• May involve breaking clusters into separate servers
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Evict node
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- ProdAppCluster
  - MainDB, AuthDB
  - SAN Connected
  - Clustered (ProdMainDB01)

- ProdAppReplDist
  - Replication

- ProdAppReplica (virtual name, load balanced)

- ProdAppRepl01
  - SAN Connected

- ProdAppRepl02
  - SAN Connected
  - Own Distributor

- Log Shipping (rolling upgrade)

Remove from LB
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Fail over log shipping

Log Shipping

ProdDRMainDB01
MainDB, AuthDB
SAN Connected

ProdAppCluster
MainDB, AuthDB
SAN Connected Clustered
(ProdMainDB01)

Replication Distributor

ProdAppRep1Dist
Replication

ProdAppReplica (virtual name, load balanced)

ProdAppRep101
SAN Connected

ProdAppCl02
MainDB, AuthDB
SAN Connected Clustered
(ProdMainDB02)

Config Repl.

ProdAppRep102
SAN Connected
Own Distributor
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Special migrations

• Failover clusters
  • Migrate to new cluster

• Replication
  • Can replicate between versions
  • Use virtual names for replicas
  • Log shipping -> replication, initialize from backup

• Log shipping / mirroring
  • Can be upgraded via rolling upgrades
  • Supported upstream only

• AlwaysOn Availability Groups
  • Configure after migration/upgrade

• 24/7 minimal downtime environments
  • Use the shuffle method to minimize downtime
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Sample upgrade plan
• On my blog: www.sqlsoldier.com along with other files

Platform Upgrade: Phase 1

Phase one of the Platform Upgrade Project (PUP) will be migrating the SQL Servers. Due greatly to the inability to load balance OLTP SQL Servers and the upgrade consisting of both OS and SQL Server, the upgrade process for phase 1 will be the trickiest and we opted to tackle this part first. With the exception of the LogApp SQL Servers, all upgraded SQL Servers will be running on Windows 2008 R2 SP2 x64. Due to limitations in the current architecture of LogApp, the LogApp SQL Servers will be upgraded to Windows 2008 SP2 x86 and SQL Server 2005 SP2. These will be upgraded separately after the architecture limitations have been corrected.

Dev Migration
The platform migration in Dev will be the simplest as we are replacing all existing SQL Servers. The current hardware in Dev is approaching “end of life” and replacement hardware has already been ordered. Log shipping will be used to synchronize the databases and all systems can be cutover at the same time with a singular downtime.
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Post failover

• Check compatibility level of all databases
• Rebuild the indexes
• If upgraded from SQL Server 2000
  • Run DBCC CheckDB() With Data_Purity;
  • Run at first upgrade point and fix any issues before continuing
  • Check Page Verification option of all databases and set to CheckSum
• Consider adjusting Max Server Memory
Questions?
Thank You for Attending

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